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Small City Transit

CHAPEL HILL,
NORTH CAROLINA:

Public Transit Serving
a University and Town



Dept. of Transportation

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U. S. DEPARTMENT OF TRANSPORTATION
Urban Mass Transportation Administration
Office of Service and Methods Demonstrations
Washington, D. C. 20590

*Transportation
3 Systems Center.*

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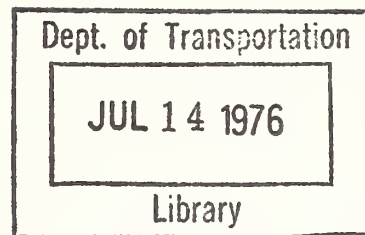
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Preface

This document was prepared by the Transportation Systems Center (TSC) as part of the information dissemination function of the Office of Service and Methods Demonstrations, Urban Mass Transportation Administration. This case study is one of thirteen studies of public transit systems in small communities and is intended to serve as an information resource for other communities in the process of planning or considering public transportation.

The information presented in this document is based on a visit to the site, interviews and phone conversations with the principals involved, and operating records obtained during 1975. The authors gratefully acknowledge the cooperation of local officials and transit operators at all of the sites selected for study, and of the TSC staff in compiling the information gained from these studies and assisting in its interpretation.

CHAPEL HILL, NORTH CAROLINA: Public Transit
Serving A University And Town

Chapel Hill Community Transit is a fixed-route public transit system serving the Town of Chapel Hill and the University of North Carolina which lies within its boundaries. The idea for a public transit system was conceived, nurtured and finally brought to fruition largely by the efforts of local public officials although a public vote on Town financial support was necessary to provide funding. The transit system provides a surprisingly high level of service for a community the size of Chapel Hill, but the presence of a sizeable University student population and a high degree of ridership by the students and University staff make the Town an atypical small community. The Chapel Hill story is an example of a cooperative arrangement between a town and a resident university in working toward alleviation of parking and congestion problems.

The Town

Chapel Hill is a fast growing community located at the Southwestern point of the Raleigh-Durham Research Triangle. Durham, a neighboring university town, lies ten miles to the north of Chapel Hill, and Raleigh, the state capital lies twenty-five miles to the east. Chapel Hill is dominated by the presence of the University of North Carolina (UNC), the first state university in the country. The Town is considered to be a wealthy community. Its median income per household was estimated in 1974 at slightly over \$15,100.

The 1974 population estimate by the Town Planning Department was 32,000. Some 7,500 UNC students, mostly married, who reside in the area all year are probably included in this figure. Enrollment at UNC has increased dramatically from 8,600 in 1960 to 20,000 in 1975. The population in Chapel Hill by 1980 is expected to be somewhere between 37,000 and 44,000 according to a 1971 projection issued by the Chamber of Commerce. The projection was based upon the anticipated growth of UNC, the industrial potential of Orange County, the retirement attractions of Chapel Hill, and the impact of the Research Triangle Park. The Park consists of 5,000 acres of land set aside for research and research-oriented manufacturing. As of March, 1969, companies in the Research Triangle Park complex employed 5,332 people, 1600 of whom were Chapel Hill residents.

The major employer in the Town, however, is the University. In 1971, UNC employed 7,961 persons with a total payroll of \$59 million. Another large employer is North Carolina Blue Cross - Blue Shield.

Chapel Hill is also somewhat of a tourist attraction. The University of North Carolina and its Morehead Planetarium, the North Carolina Symphony and historical landmarks draw many visitors to the area.

Origin and Planning

Public transportation was suggested in 1965-66 when one member of the Board of Aldermen proposed a mini-bus transit service for Chapel Hill. A consultant study, funded by the Town and the University, concluded that the Town was a marginal candidate for public transit.

During the 1969 mayoral campaign, one of the candidates, Howard Lee, used public transit as one of his top issues. His desire for a transit system stemmed from a concern over the amount of traffic congestion and pollution in the town, and the rapid increase in the University student population.

Following the election of Mayor Lee, a citizen Task Force was appointed to restudy the issue of the feasibility of implementing a transit service. By that time the University of North Carolina student government had begun a campus shuttle with some financial assistance through student fees. The Task Force recommended that the Town of Chapel Hill and the neighboring town of Carrboro, together with the University, implement a public transit system incorporating the University Shuttle. The Task Force acknowledged that subsidization would be necessary.

A Public Transportation Study Commission was appointed by the Mayor in January, 1970. The group was comprised of representatives from Carrboro, Chapel Hill, the University, and the student body. It moved to initiate a technical study under UMTA's grant program while at the same time initiating a locally supported trial service. (The State of North Carolina at that time did not provide financial assistance for public transit.)

The trial system was implemented with seven buses leased from Raleigh City Coach Lines, Inc., at a cost of \$100 per day, per bus. The system was poorly organized and managed. By spring, 1971, the \$14,000 appropriated for its support was exhausted and the operation ceased on the day before the vote on a referendum authorizing tax-based support for transit. This referendum failed by one vote.

The technical study under the UMTA grant was completed in late summer of 1972 and recommended an extensive system with participation by Carrboro, Chapel Hill and the University. Implementation required approval, by referendum, of bonds for the matching funds for capital

needs of the proposed system and the use of tax income for the operating subsidy. Tentative agreement was reached with the University of North Carolina administration on parking policy revisions as well as assistance in pass marketing.

A second referendum was held in February, 1973, for authorization of \$350,000 in bonding capacity for local capital grant funds, and up to 10¢ per \$100 valuation in property taxes to subsidize the operations. In Chapel Hill both questions passed by 65% of the popular vote. However, residents of Carrboro voted against participation in the transit service. (It should be noted that initially the Chapel Hill Chamber of Commerce, local merchants, and the news media were against the system, but supported the Mayor's efforts after the second referendum had been approved by the townspeople.)

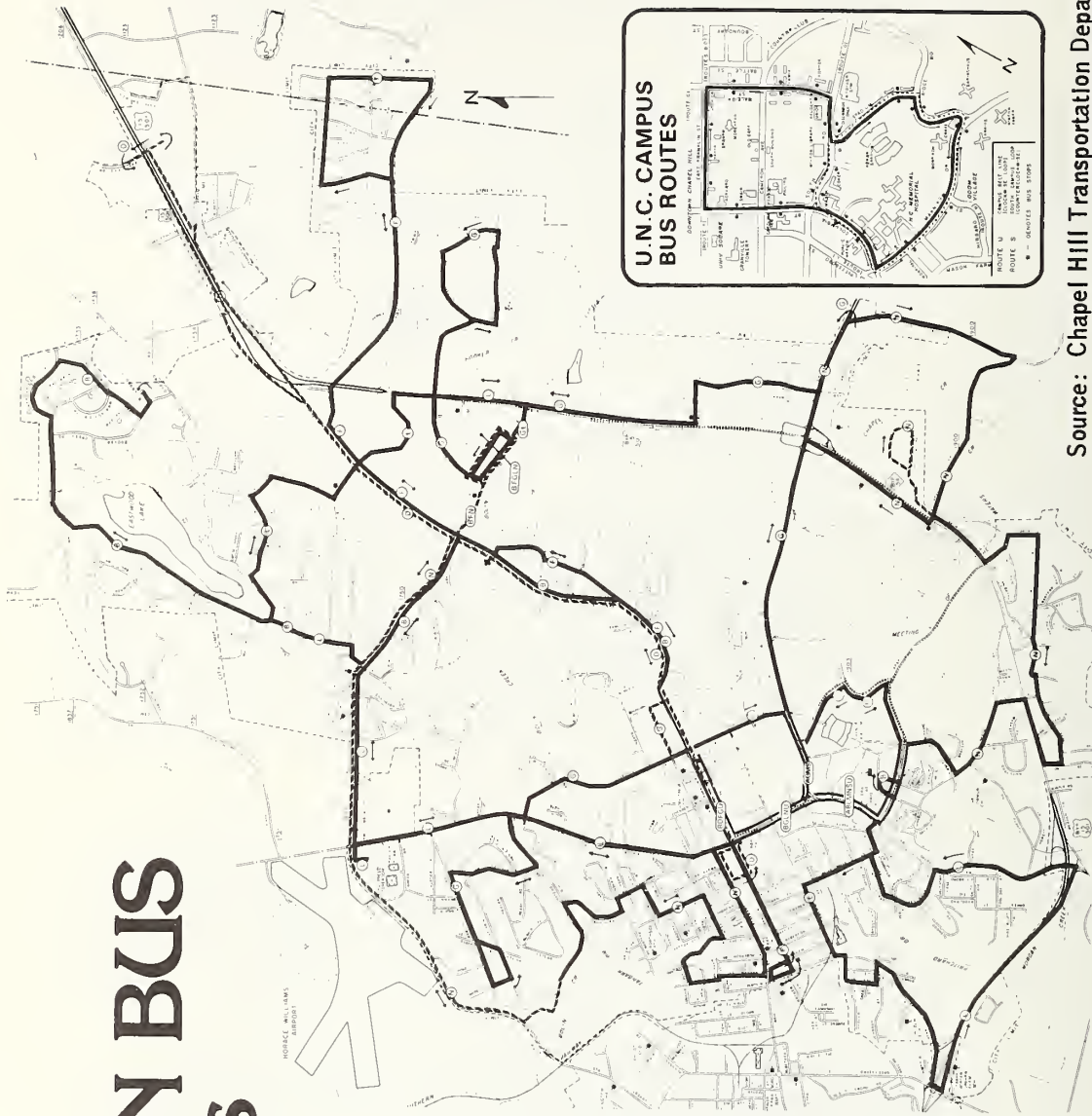
By June 1, 1973, an \$800,000 capital grant application for new buses, a maintenance facility and necessary equipment had been forwarded to UMTA. Application approval was received in January, 1974, and was immediately followed by advertisement for equipment bids. When it became evident that the buses on order would not arrive in time to begin the service on the date promised, the Town purchased 22 used 45-passenger buses from the Metropolitan Atlanta Rapid Transit Authority (MARTA). On August 1, 1974, the Chapel Hill Community Transit service began. New parking fees and provisions were implemented by the University in cooperation with the new bus system.

System Operations

Bus service is provided on ten routes during weekdays and six routes on weekends and holidays (Figure 1 and Table 1). Two of these routes provide loop service around the UNC campus. The "U" route, which provides the major campus service, also connects with the downtown area. Two peak period park-and-ride express routes offer direct service from the UNC Airport lot and the University Mall to the campus and the UNC Hospital. The airport lot is restricted to persons affiliated with the University, but anyone may utilize the University Mall facility. The remaining routes provide service to residential areas. Service is provided within three blocks for 85% of the population. Except for the campus loops, the park-and-ride routes and Route D, weekday service is offered from about 6:15 AM to 1:00 AM. Weekend service operates on a reduced schedule.

In November, 1974, four new GMC 42-passenger coaches were delivered. In December, thirteen new Twin Coach vehicles arrived, twelve of which seat 25 passengers. The other Twin Coach is equipped with an additional folding lower step, a lift, 12 seats, and wheelchair tie-downs for

TOWN BUS routes



MAIN AREA ROUTES ① BOOKER CREEK • U.N.C. HOSPITAL ② DURHAM BOULEVARD • PINEGATE ③ FRANKLIN ST. • COLONY WOODS ④ GLEN LENOX • COLONIAL HEIGHTS ⑤ LAKE FOREST • MERRITT MILL • WESTWOOD ⑥ NORTHSIDE • MORGAN CREEK	
PART-TIME ROUTES Please consult individual timetables	
CAMPUS SHUTTLES ⑦ SOUTH CAMPUS LOOP (Counterclockwise) ⑧ CAMPUS BELT (Clockwise)	
PARK / RIDE EXPRESS ROUTES ⑨ AIRPORT LOT ⑩ MALL LOT	
942-5174 TOWN BUS INFORMATION	

Source: Chapel Hill Transportation Department

Figure 1. Bus Routes

TABLE 1
BUS SERVICE SCHEDULE SUMMARY

WEEKDAY - U.N.C. IN SESSION - SCHEDULES EFFECTIVE AUGUST 23, 1975

HEADWAYS														
ROUND TRIP ROUTE	SCHED- ULED MILES	SCHED- ULED HOURS	SCHED. SPEED (MPH)	FIRST INBOUND TRIP	LAST OUTBOUND TRIP	AM PEAK* (BUSES)	(NO.) (BUSES)	BASE* (BUSES)	(NO.) (BUSES)	PM PEAK* (BUSES)	(NO.) (BUSES)	EVE.* (BUSES)	(NO.) (BUSES)	NIGHT* (BUSES)
A EXPRESS	6.01	158	12:37	12.5	700a	600p	15	(2)	-	15	(2)	-	-	-
B	13.89	418	31:19	13.4	630a	1241a	25	(2)	30	(2)	30	(2)	60	(1)
D	8.69	82	6:12	13.2	718a 305p	918a 545p	40	(1)	-	40	(1)	-	-	-
F	12.54	461	37:25	12.3	629a	1236a	16	(3)	30	(2)	20	(3)	60	(1)
G	16.68	702	53:15	13.2	631a	1231a	20	(4)	25	(3)	20	(4)	40	(2)
L	16.79	723	54:24	13.3	625a	1230a	15	(5)	25	(3)	15	(5)	60	(1)
M EXPRESS	7.27	216	13:52	15.6	700a 200p	1000a 617p	12	(2)	-	12	(2)	-	-	-
N	20.99	696	53:14	13.1	614a	1221a	17	(4)	30	(3)	25	(4)	45	(2)
CAMPUS S	1.77	155	16:21	9.5	726a 630p	428p 930p	5	(2)	10	(1)	-	12	(1)	-
CAMPUS U	2.77	363	37:35	9.7	634a	125a	8	(2)	6	(3)	6	(3)	15	(1)
TOTALS	107.40	3,974	316:15	12.6			(27)	(27)	6	(3)	6	(3)	15	(1)
* - SERVICE PERIODS DEFINED														
AM PEAK - APPROXIMATELY 7:00-9:30 AM														
BASE - 9:30 AM TO 3:30 PM														
PM PEAK - APPROXIMATELY 3:30-6:00 PM														
EVENING - 6:30-9:30 PM														
NIGHT - AFTER 9:30 PM														
RECAP OF RUNS:														
EARLY STRAIGHT 10														
EARLY SPLIT 17														
MIDDAY STRAIGHT 5														
LATE STRAIGHT 10														
WEEKLY RELIEF 7														
P.M. TRIPPERS 1														
TOTAL 42														

SOURCE: CHAPEL HILL TRANSPORTATION DEPARTMENT

use by elderly and handicapped persons. Beginning in early 1976, this vehicle will be used in demand-responsive service for the elderly and handicapped. The bus system is currently operating with an active fleet of 34 vehicles, 27 of which are in service during the peak periods.

Town residents and students are encouraged to purchase annual passes. However, cash fares can be paid on the buses. The fare schedule is shown in Table 2. Presently, one out of every four passengers pays a cash fare. By an agreement between the Town and the University, the University purchased \$300,000 worth of system bus passes the first year of operation and \$330,000 worth the second year. The University in turn sells the passes to the students at a reduced rate. During the 1974-75 school year, the University sold (or included with parking permits) 7,550 annual passes, 5,230 first semester passes, 6,000 second semester passes and 1,000 summer school passes. As of June 1, 1975, the Town had sold 453 annual passes and 350 40-ride passes.

In order to discourage automobile commuters from driving into congested core campus parking areas, the number of core parking permits issued by the University was reduced from an unlimited number to 110 percent of the number of parking spaces. Their cost was raised from \$10 to \$72 a year. A bus pass is included with each parking permit sold. Students are encouraged to store their cars at the UNC Airport lot (\$3 annual fee) and use the buses for their Chapel Hill trips.

UMTA provided 100 percent funding for a one-year evaluation study of the bus system by the UNC Department of City and Regional Planning. It included a before-and-after telephone survey designed to monitor public expectations, perceptions and satisfaction over the initial six months of system operation. An on-board survey was performed to identify ridership characteristics. A final report was published in June, 1975.

The bus system is operated by the Transportation Department of Chapel Hill. The Transportation Department, as a municipal department, gets its funds from the Town Budget. An open hearing is held on the Budget but the final appropriation is made by the Board of Aldermen.

TABLE 2. FARE STRUCTURE

CASH FARES

	<u>ADULT</u>	<u>UNDER 13 and OVER 65</u>
All Town Routes Except Campus Shuttles	25¢	15¢
Campus Shuttle Routes "S" and "U"	15¢	15¢
Transfers	Free	Free

PASSES

	<u>UNC Students Faculty and Staff</u>	<u>Others Not Connected with UNC</u>
#Annual Pass --		
Good for 12 Consecutive Months	N/A	\$30.00
Good for Academic Year	\$24.00	N/A
Semester Pass	\$10.00	N/A
Summer Session Pass	\$ 4.00	N/A
& 40-Ride Punch Tickets	\$ 8.00	\$ 8.00

NOTES

* Transfers are free, but shuttle passengers must pay full regular fare to obtain transfer.

Annual passes are non-transferable and require identification.

& 40-Ride Punch Tickets are transferable.

Chapel Hill considered the possibility of a management contract for the operation of its transit system. However, the Town decided on a municipally run system which they thought would be less expensive and over which they could exercise more direct control. Municipal operation was possible only because Chapel Hill was not previously served by a transit system. Otherwise, they would have had to negotiate with transit labor unions (if UMTA funds were applied for), an action which is prohibited by North Carolina statutes.

The Transportation Department has 80 employees, including 49 full-time and 18 part-time drivers. All Transportation Department personnel are municipal employees and receive the same privileges and must abide by the same rules and regulations as all other municipal employees. Some of the drivers belong to the Amalgamated Transit Union. However, since the Town cannot bargain with labor unions, the impact of the Union on the transit system is virtually nonexistent.

The Town citizenry maintains an active interest in the operation of the bus system. In fact, several route changes have been instituted as a result of citizen action. Official responsibility for monitoring the system operation belongs to the Transportation Board, an advisory group to the Town Manager and the Board of Aldermen on transportation matters.

Results

System characteristics and ridership are summarized at the end of this report. Patronage estimates for the new bus system had been based on the results of a survey conducted by telephone prior to system operation. However, public response to the system during the initial weeks far exceeded expectations. Buses were overloaded to the point of having to by-pass patrons standing at the curb. The excessive down time of the old buses contributed to the capacity problem. Even after the arrival of the new buses (the majority seating only 25 passengers), a deficiency of capacity still plagued the system and undoubtedly was a factor in the first year ridership decline from the early months although patrons were no longer being by-passed at the bus stops. Monthly ridership fell from a high of 254,000 in October, 1974, to 208,000 in April, 1975, the last full month of University classes. The monthly totals are highly variable according to the number of class days in the month. Nevertheless, even on class days, average ridership fell from nearly 11,000 in the fall to less than 9,000 in the spring. There are, however, fewer students registered at UNC during the spring semester. It is also possible that

the advent of warmer spring weather was also a contributing factor in this decline.

During the summer when the UNC student population dropped to 12,000 (from 20,000) the bus ridership dropped also. However, since the 1975 fall semester at UNC began, ridership was well over that experienced the previous year, reaching over 14,000 on some days. A January, 1975 count showed that approximately 12 percent of the daily ridership occurred during the peak hour between 8-9 a.m.

The productivity achieved by Chapel Hill Community Transit is 25.9 passengers per vehicle-hour, which is quite high in comparison to other small community transit systems.

The on-board survey conducted during 1975 as part of the UMTA evaluation grant, revealed that 72.5 percent of the riders are college students. Another 17.6 percent are UNC Staff members or Memorial Hospital workers. Children under sixteen (3.1%) and senior citizens (0.7%) are not frequent users of the system. Low patronage is also evident among hospital workers and housewives. Because of the diverse travel destinations of housewives and the late night travel needs of hospital personnel, ridership in these groups is expected to be low.

A majority of Chapel Hill residents have a choice in mode of travel for their trips. According to the on-board survey, 41.7% of the passengers who rode the bus could have used an automobile.

The telephone survey conducted after the bus service was in operation indicated that public attitudes and perceptions of the bus system changed after use of the system. The implication of this fact is that persons may not be able to give meaningful attitudinal responses regarding a transit service before they have the opportunity to use it.

The older MARTA buses are unreliable in that they are subject to frequent mechanical failures. They are costly to keep in running condition. In addition, the old buses are noisy, emit gaseous fumes, and are not air-conditioned. However, even some of the new small buses have had problems. A series of design changes have been suggested, and in some cases these changes have been implemented so as to improve the performance of these vehicles.

The budget for the current fiscal year is \$1,065,000 or \$254,000 more than the budget for the eleven months of operations in the last fiscal year. Pass sales and farebox revenues are expected to amount to approximately \$480,000, with the remainder being made up primarily through revenue

sharing funds and property taxes. Last year's vehicle operating cost was 93.8¢ per bus mile or \$11.08 per bus hour, nearly half of which was covered by operating revenues. Service expansion is very costly. The addition of the North Lakeshore route, for example, added about \$200,000 to \$250,000 to yearly system operating costs.

It is uncertain as to how much taxis have been affected since the system was implemented. There are three taxicab companies operating 30 or so cabs in Chapel Hill. Company owners and drivers have given conflicting reports concerning change in patronage levels.

Merchants at the University Mall have complained that the use of their lot for park-and-ride services interfered with customer parking. In response to this complaint, the park-and-ride service for this area of Town will soon be moved to another location, in the same general vicinity.

The bus system has definitely benefited UNC. So far the University has been able to forego previously contemplated development of additional parking areas.

The general attitude of the public toward the system has been favorable. Some criticism has been voiced by people who feel a bus system is essential, but that the present service is excessive. The Chamber of Commerce has called for an audit of the bus system because of its high cost. Other individuals feel the University should contribute more money to finance the system since it is used predominantly by students and faculty.

Needs

In order to continue to provide a high quality service and to develop new patronage, Chapel Hill needs additional capital funds. Remaining bonding capacity available for local matching funds is \$108,000. Use of these funds to match an UMTA capital grant would not even be sufficient to replace all the old buses. Only seven new buses are requested in the pending UMTA grant application. Funding has been secured through an UMTA grant to construct 17 bus shelters.

Additional park-and-ride lots are needed in other parts of the Town to relieve congestion in lots now being utilized. Informal park-and-ride activity is occurring at the edge of streets and highways near bus stops causing safety hazards and annoying residents on those streets.

Chapel Hill presently does not have a permanent maintenance facility. Present maintenance conditions are so unsatisfactory that a temporary maintenance shop is being

constructed. The latest UMTA grant application includes a permanent maintenance plant to replace the temporary facilities now under construction. The building itself will be used for other purposes, once the maintenance activities are moved to the permanent location. Additional mechanics would also be useful in helping to keep the buses in operating condition as well as implementing the design changes for the new vehicles.

Due to the minimal staffing of the Town Transportation Department, a subject that has received little attention is that of marketing. Presently, the publishing of the route maps and schedules is about the only information disseminated by the Town to the general public. (The Chapel Hill newspaper, often critical of the cost of the system, does tend to keep the Community Transit system in the news.) A more aggressive campaign might be effective in generating more ridership. Increasing off-peak use of the system would be especially desirable.

Future Plans

Some reduction in the level of service during evenings and weekends is being considered in order to reduce operating costs during low ridership periods. An increase in the cost of bus passes is also being discussed as a means of reducing the subsidy. Route adjustments will likely continue to tailor service as much as possible to the needs of the community. A marketing and public relations campaign is also under consideration.

One park-and-ride lot is planned for the south side of town. Acquisition of the land is expected in two years. Service to Carrboro is still a possibility, if Carrboro residents reverse their position and vote for transit. Also possible is an expansion of service to the Research Triangle Park and the institution of a shuttle service to two universities in Durham.

Conclusions

The bus system has been successful in terms of greatly exceeding even the most optimistic ridership estimates. The bus system has not, however, noticeably reduced downtown traffic congestion or air pollution as was hoped. It has reduced the demand for parking spaces and has given residents and UNC students excellent mobility at a very reasonable price.

The decline in ridership from the fall of 1974 to the spring of 1975 could have been caused by a number of factors including initial disenchantment with the system because of its lack of sufficient capacity during peak periods, a

decline in student population and the arrival of warmer weather. Overcrowded buses and by-passing patrons at bus stops undoubtedly turned away potential users at the beginning. Peaking is still a problem on a few routes but customers are no longer being by-passed. Ridership during the summer was quite low, as would be expected with the reduction in the UNC student population. However, ridership increased dramatically once the 1975 fall semester began and was averaging close to 13,500 passengers per day during class days in September.

Overall productivity is quite high for a small community transit system. However, the presence of the University of North Carolina makes this a special situation. Ridership by UNC students and staff accounts for the bulk of transit patronage. The parking policy, implemented by the University, of restricting the number of on-campus parking permits issued, together with a sevenfold increase in the price of the permit (and the inclusion of a bus pass with the issuance of the parking permit) is unquestionably a major factor in the high student and staff usage.

The commencement of operations with used buses as well as the continued use of some of them after the new buses arrived, has resulted in very high maintenance costs. The limited capacity of the majority of the new buses, which were purchased on the basis of much lower ridership forecasts, means that more buses must be utilized to provide reasonable service and driver costs are consequently increased. Even so, the Chapel Hill Community Transit System operates well within the range of costs experienced in other small community transit systems.

The townspeople seem to be overwhelmingly in favor of transit. However, criticisms have been voiced concerning the high level of service, the cost, and the level of financial support from the University. It seems clear that the Chapel Hill Community Transit System has outgrown the personnel and financial resources allocated to it when the system was approved initially by the voters. It has become a rather large scale bus system for a relatively small community to support. Unless a new funding source is uncovered, the Town appears to face a choice between cutting back service or increasing the local subsidy. Neither option is especially appealing.

SUMMARY OF CHAPEL HILL TRANSIT SYSTEM CHARACTERISTICS

DEMOGRAPHICS

Population in service area: 32,000
Population density: 3,300 persons per square mile
Median household income: \$15,110 (1974)
Cars owned per household: 1.4
Percent carless households: 3%
Percent transit dependent: n/a
Average distance to service: 85% of population lives
within 3 blocks of a bus route

COVERAGE AND SERVICE

Number of routes: 10
Route length (one-way): .89 to 10.5 miles
Average route-time (one-way): n/a
Time of service: 6:15 am - 1:00 am daily
(Three routes peak period only; one campus
route in morning and evening only; Some
routes not operated on weekends)
Headways: peak headways generally vary from 12 to
25 minutes; one peak period route headway is
40 minutes; the campus loops run on 5 and 8
minute peak headways; reduced frequencies
during midday and evening
Number, types and average capacity of vehicles:
12 TC 25s 25 seats
1 TC 25 12 seats and wheelchairs
4 GMC T6Hs 44 seats
22 GMC TDHs 45 seats
Number of vehicles in service: 27

COST AND PRODUCTIVITY

Vehicle miles per day: 3,974
Vehicle hours per day: 316.25
Total vehicle miles per day: 4,123
Driver hours per day: 338
Operating costs per vehicle hour: \$11.08
Operating costs per vehicle mile: \$0.93
Operating cost per passenger: \$0.43
Passengers per vehicle-mile: 2.19
Passengers per vehicle hour: 25.92
Driver wage rate per hour: \$3.80 plus town
employee fringe benefits

REVENUE AND SUBSIDY

Fares: 15¢ on campus loops, 25¢ on other routes,
15¢ for elderly and youth; \$30 annual pass;
\$8 for a 40-ride ticket, reduced rate for
UNC student, faculty and staff passes

Revenue per passenger: \$0.20

Operating subsidy per passenger: \$0.23

Operating ratio (cost/revenue): 2.1

Lease or buy vehicles: Buy

Funding:

	<u>Capital</u>
Federal	\$860,480
State	--
Local	215,120
Total	\$1,075,600

RIDERSHIP

Average passengers per weekday: 13,500 (class days
in September, 1975)

Ridership growth rate: Multiplied by 1.3 in 1 year

Ridership composition:

	<u>Age</u>
Under 16	3.1%
16 - 25	72.3%
26 - 65	23.9%
Over 65	0.7%

	<u>Occupation</u>
Retired	0.6%
Housewife	0.9%
Student	3.5%
UNC Student	72.5%
UNC Staff	13.7%
UNC Hospital	3.9%
Employed (non-UNC)	4.9%

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